CSA TS-226:24

Geological storage of carbon dioxide — Measurement, monitoring, and verification plans

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Preface

This is the first edition of CSA TS-226, *Geological storage of carbon dioxide — Measurement, monitoring, and verification plans*. This Technical Specification (herein referred to as "this Document") is not a consensus project; that is, it is not a Standard and it has not been formally approved by a Technical Committee.

CSA Group acknowledges that the development of this Document was made possible, in part, by the financial support of NRCan.

CSA Group acknowledges the permission from Enhance Energy Inc. for the use of Figure B.1.

This Document was developed and reviewed by the Task Force on Measurement, Monitoring, and Verification Plans.

Notes:

1) *Use of the singular does not exclude the plural (and vice versa) when the sense allows.*
2) *Although the intended primary application of this Document is stated in its Scope, it is important to note that it remains the responsibility of the users of the Document to judge its suitability for their particular purpose.*
3) *This Document is subject to review within three years from the date of publication. Suggestions for its improvement will be referred to the appropriate committee. To submit a proposal for change, please send the following information to inquiries@csagroup.org and include "Proposal for change" in the subject line:*
   a) *document designation (number);*
   b) *relevant clause, table, and/or figure number;*
   c) *wording of the proposed change; and*
   d) *rationale for the change.*

SDG Foreword

CSA Group develops and maintains Standards across a broad range of topics, most of which support the United Nations Sustainable Development Goals (UN SDGs) towards shaping a sustainable and resilient future.

Through a robust mapping process, connections between CSA TS-226:24 and the following SDGs have been identified:

SDG			
Targets	7a	9.4, 9.5	13.1, 13.2, 13.3

CSA TS-226:24 has notable linkages with the following SDGs:
- SDG 7: *Affordable and Clean Energy*
- SDG 9: *Industry, Innovation, and Infrastructure*
- SDG 13: *Climate Action*

For further information on CSA Group's SDG Mapping initiative, please visit: https://www.csagroup.org/sdg/.

Disclaimer: It is important to note that although some Standards explicitly support SDG targets, not all Standards link to the SDGs. Standards users should always take care and be specific when claiming their support of SDGs through the use of Standards. The SDG mapping outcomes made available by CSA Group are intended to assist users in their evaluation of how the application of a Standard can support their work towards SDG achievement.

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0 Introduction

It is broadly recognized that the geological storage of carbon dioxide (CO_2) is a key means of reducing anthropogenic emissions of CO_2 to the atmosphere, thereby reducing the increase of atmospheric CO_2 concentrations. To advance the use of the geological storage of CO_2 in accordance with CSA Z741, monitoring and verification programs are a required element in the development of a storage project. To provide confidence to, and acceptance by, regulators, stakeholders, CO_2 capture project and transport operators, and carbon offset crediting agencies, preparation of measurement, monitoring, and verification (MMV) plans are necessary to detail the efforts the storage project proponents will use to

a) assist in managing health, safety, and environmental risks by demonstrating containment of injected CO_2 providing confidence that CO_2 emission reductions are real and permanent; and
b) assess storage performance.

The goal of this Document is to provide guidance to geological CO_2 storage project operators on the preparation and maintenance of MMV plans throughout the life of the project, from initial project site selection to its ultimate closure. Regulators and stakeholders, including agencies administering offset credits, may also benefit from this Document to ensure the project meets the goals stated above.

1 Scope

1.1 General

This Document provides recommendations and guidance on preparing and maintaining measurement, monitoring, and verification plans for the geological storage of CO_2 streams in accordance with CSA Z741, regardless of whether the project is located onshore or offshore. While not intended for storage associated with enhanced oil recovery using CO_2 injection, the Technical Specification could be useful for those projects.

1.2 Inclusions

In addition to CSA Z741, this Document may be applicable for use with ISO 27914. This Document is applicable to projects that are located in onshore or offshore environments.

1.3 Exclusions

This Document is not meant to apply to the storage of CO_2 associated with CO_2-EOR. However, as shown by Annex B, the use of MMV plans might be required by regulators and therefore this Document may be used by project proponents, regulators, and interested parties in those situations.